

In Capsule Series

Internal Medicine

INFECTIONS

First edition

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INFECTIONS SCHEME

Etiology :

1. Causative organism:
2. Source of infection :
3. Mode of infection :

Clinical picture :

1. Incubation period : *Usually 1 – 2 weeks , but in cholera 1 – 5 days.*
2. Clinical manifestations.
3. Clinical variants.
4. Complications : *specific +itis*

Investigations :

1. CBC :
2. Culture :
3. Serological tests.
4. Specific :

Differential diagnosis :

1. Specific.
2. PUO (*Pyrexia of Unknown Origin*)

Treatment :

a) Prophylaxis :

- i. Hygienic measures.
- ii. Case finding.
- iii. Isolation & Proper treatment.
- iv. Chemo & immuno – prophylaxis :

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Infections

b) Therapeutic :

- i. General : Rest , light nutrient diet.
- ii. Symptomatic : antipyretic.
- iii. Specific :
- iv. Treatment of complications.

TYPHOID

Etiology :

1. Causative organism: Salmonella typhi & paratyphi A & B
2. Source of infection : Patient , Carrier.
3. Mode of infection : Feco – oral transmission.

Clinical picture :

1. Incubation period : 1 – 2 weeks .

2. Clinical manifestations :

1st week : 10 (3 general + 3 respiratory + 3 GIT + rash)

- i. Fever : temperature rises in a **step ladder** manner until reaching 39 – 40° C by the end of the 1st week.
- ii. Headache.
- iii. **Relative bradycardia.**
- iv. Sore throat.
- v. Cough.
- vi. Epistaxis.
- vii. Coated tongue.
- viii. Constipation.
- ix. Spleen : palpable , soft & tender.

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Infections

x. Rash (rose spot) : 10%

o Site : Trunk.

o Duration : Transient.

2nd week : (The same as 1st but severe , no rash)

o Fever : ↑ , Continuous

o Headache : ↓ with delirium.

o Tachycardia.

o Coated tongue .

o Splenic enlargement.

o Diarrhea may occur (pea soup).

3rd week : either

o Clinical manifestations start to improve. or

o Complications occur.

4th week :

Convalescence begins (*but relapse may occur*)

3. Clinical variants :

o Afebrile.

o Ambulatory.

o Abortive (mild)

o Grave : (severe)

o Sudoral form : excessive Sweating.

o Localized : **Pleuro** typhoid , **pneumo** typhoid , **meningo** typhoid.

4. Complications : *specific + ...itis*

o GIT :

✓ Intestinal hemorrhage , Perforation.

✓ Peritonitis , Cholecystitis.

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Infections

- o CNS :
 - ✓ Meningitis , encephalitis , peripheral neuritis.
 - ✓ Typhoid state : delirium , convulsion.
- o CVS : myocarditis.
- o Chest : Epistaxis , bronchitis .
- o Renal : Pyelonephritis , GN.
- o Relapse.

Investigations :

1. CBC :
 - o ESR : ↑
 - o Leucopenia with relative lymphocytosis.
2. Culture :
 - o Blood culture : +ve in 1st week
 - o Stool culture : +ve in 2nd week.
 - o Urine culture : +ve in 3rd week.
3. Specific : (**Widal test**)
 - o It is +ve from 2nd week.
 - o It is +ve when titre > 1/80

Differential diagnosis : PUO (*Pyrexia of Unknown Origin*)

Treatment :

- a) Prophylaxis :
 - i. Hygienic measures.
 - ii. Case finding.
 - iii. Isolation & Proper treatment.
 - iv. Immuno-prophylaxis : TAB vaccine.
 - v. Treatment of carriers :
 - o Ampicillin : **6** gm/d for **6** weeks.
 - o Cholecystectomy : may be indicated in resistant cases.

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Infections

b) Therapeutic :

- i. General : Rest , light nutrient diet.
- ii. Symptomatic : antipyretic.
- iii. **Specific :** for 2 weeks 3 C
 - ✍ **C**hloramphenicol : 50 mg/kg/d , orally
 - ✍ **C**iprofloxacin : 750 mg/12h .
 - ✍ **C**o-trimoxazole (septrin) : 2 tab / 12h.
- iv. Treatment of complications.
 - ✓ Perforation : surgical treatment.
 - ✓ Hemorrhage : blood transfusion & anti-shock measures.

Side effects of ciprofloxacin:

- Hypersensitivity
- Photosensitivity
- Nephrotoxic
- Chondrolytic, reversible arthropathy (CI in pregnancy ,lactation, prepubertal children)
- Confusion, headache
- Crystallurea
- Distension GIT , super infection

BRUCELLOSIS

(malta fever , undulant fever)

Etiology :

1. Causative organism: Brucella , Gm –ve coccobacilli
2. Source of infection :
 - o Brucella melitensis : in goats
 - o Brucella abortus : in cows
 - o Brucella suis : in pigs.
3. Mode of infection :
 - o Drinking contaminated milk.
 - o Dealing with infected animals : farmers , veterinarian.

Clinical picture :

1. Incubation period : 1 – 2 weeks .
2. Clinical manifestations : *mnemonic* : **brucellosis**
 - o **B**one & muscle pain.
 - o **R**elapsing fever : fever lasts for 10 days then apyrexia for 10 days , then relapse and so on.
 - o **C**onstipation , nausea , vomiting.
 - o **L**ymph node enlargement.
 - o **L**iver : enlarged , tender.
 - o **S**pleen : enlarged.
 - o **S**weating.

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3. Clinical variants :

- o Intermittent.
- o Mild.
- o Localized brucellosis e.g. bone , testis.
- o Remittent.
- o Malignant.

4. Complications :

- o Relapse.
- o Infective endocarditis. يبوظ القلب و يمنع المشاعر
- o Orchitis. يمنع اللي بالي بالك
- o Paraplegia due to transverse myelitis. يجييك شلل
- o Abortion. وبعد كل ده لو حصل حاجة

Infections

- o Continuous

Investigations :

1. CBC : Lymphocytosis , ↑ ESR
2. Culture : blood culture +ve during fever spike.
3. Serological tests : Brucella agglutination test.

Differential diagnosis :

1. Fever with lymphadenopathy.
2. PUO (*Pyrexia of Unknown Origin*)

Treatment :

a) **Prophylaxis** : Hygienic measures e.g. Pasteurization of milk.

b) **Therapeutic** :

- i. General : Rest , light nutrient diet.
- ii. Symptomatic : antipyretic & analgesics.
- iii. Specific :
 - ✎ Tetracycline : 500 mg/6h for 6 weeks. or
 - ✎ Doxycyclin : 200 mg/d for 6 weeks. or
 - ✎ Septrin : 2 tab /12h for 6 weeks
 - Plus
 - ✎ Streptomycin : 1 gm/d IM for 2 weeks or
 - ✎ Rifamicin : 600 mg/12h .
- iv. Treatment of complications.

MALARIA

Etiology :

1. Causative organism: *Four species affect mankind:*
Plasmodium vivax , ovale , malariae & falciparum.
P. falciparum is potentially lethal , the others are usually benign.
2. Source of infection : Patients.
3. Mode of infection : Bite of female anopheles mosquito.

Life cycle :

- 1) **Sexual cycle :** in female mosquito. (*exogenous phase*)
 ♀ mosquito picks up gametocytes from infected individual → sporozites → migrate to salivary gland to be injected into man.
- 2) **Asexual cycle :** in man (*endogenous phase*)
 - i. Exo-erythrocytic stage : infected mosquito injects sporozoites → which migrate to liver where they form merozoites → Merozoites are released to blood stream.
 - ii. Erythrocytic stage :
Merozoites invade the **RBCs** → signet ring form → Trophozoites → rupture of RBCs releasing merozoites which can infect other RBCs.

Clinical picture :

1. Incubation period : 1 – 2 weeks.
2. Clinical manifestations :
 - i. **Benign Tertian malaria :** (infection with *P. vivax & ovale*)
 - The attacks occur every 48 hours.
 - The attack passes into 3 stages :
 Cold stage , Hot stage & Sweating stage.

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- a) Cold stage : (lasts for 1 hour) 
 - o Acute onset of sense of coldness & rigor.
 - o Rapid rise of temperature to $39 - 40^{\circ}\text{C}$
 - o Vomiting & polyuria.
- b) Hot stage : (lasts for 8 hours) 
 - o **H**otness & flushed face.
 - o **H**eadache.
 - o **H**igh temperature.
- c) Sweating stage : (lasts for 3 hours)
 - o **S**weating with rapid fall of temperature with no or mild vomiting.
 - o **S**pleen is enlarged after 2 weeks.
- ii. **Quartan malaria :** (infection with *P.malariae*)

Similar to benign tertian malaria but the attacks occur every 72 hours.
- iii. **Malignant malaria :** (infection with *P. falciparum*)
 - a) **Ordinary tertian type :**

Clinical manifestations are similar to benign tertian malaria but :
Hot stage is prolonged.
Sweating stage : ↓
Splenomegaly occurs within less than 1 week.
 - b) **Pernicious type :** (complicated – fatal)
 - i. **A**lgid malaria : Abdominal pain , shock , hypothermia.
 - ii. **B**ilious remittent fever : Jaundice , vomiting , gastric pain.

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Infections

- iii. **C**erebral malaria : Headache , Hyperpyrexia , Focal neurological disorders , Psychosis.
- iv. **D**ysenteric type : dysentery.

c) **Blackwater fever** :

- o Blackwater fever is a complication of malaria characterized by intravascular hemolysis, hemoglobinuria and **acute renal failure**.
- o Quinine – *anti-malarial drug* – may play a role in triggering the condition.
- o Most probably autoimmune ?
- o **Clinical picture** : 
 - i. Hemolysis : Fever , rigor , anemia , jaundice.
 - ii. Hemoglobinuria : dark red or black urine (*hence the name*) , loin pain.
 - iii. **Acute renal failure** : due to massive intravascular hemolysis

3. **Complications of malaria** :

- Malignant malaria : (complications of *P. falciparum*)
 - i. Pernicious malaria : ABCD
 - ii. Blackwater fever : Hemolytic anemia , **acute renal failure**.
- Relapse : in *P. ovale* & *vivax*. (*No relapse in P falciparum*)
- Rupture of spleen.
- Tropical splenomegaly syndrome.
- Malarial hepatitis syndrome (easily mistaken clinically for viral hepatitis)
- Nephrotic syndrome : especially in quartan malaria (*P. malariae*)

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Investigations :

1. Detection of the parasite : blood film , bone marrow aspirate.
2. CBC : Features of hemolytic anemia. Leucocytosis during the attack.
3. Serological tests : to detect antibodies.
4. **Therapeutic test**: fever responds to anti-malarial drugs.
5. **Investigations for complications** : e.g. Acute renal failure.

Differential diagnosis :

1. Fever with rigor.
2. PUO (*Pyrexia of Unknown Origin*)

Treatment :

a) Prophylaxis :

- i. Hygienic measures (Anti-mosquito measures) :

Insecticides , bed nets , repellants.

- ii. Chemo prophylaxis : when travelling to endemic areas.

✍ Chloroquine : 500 mg/week, one week before arriving and 4 weeks after leaving

✍ Others : primaquine , mefloquine , proguanil.

b) Therapeutic :

Active malaria infection with P. falciparum is a medical emergency requiring hospitalization. Infection with P. vivax, P. ovale or P. malariae can often be treated on an outpatient basis.

- i. General : Rest , light nutrient diet.
- ii. Symptomatic : antipyretic.
- iii. **Specific : (Anti-malarial drugs)**

a) Tissue schizonticides (against exoerythrocytic form) :

for preventing relapse e.g.

✍ Primaquine.

✍ Pyrimethamine.

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Infections

b) Blood schizonticides :

These drugs act on the erythrocytic forms of the parasite and terminate clinical attacks of malaria. These are the most important drugs in anti malarial chemotherapy e.g.

Chloroquine :

- Dose : 4 tab at first (tab = 250 mg) , then 2 tab after 12 h then 2 tab/d for 2 successive days.
- Side effects : **C**orneal opacity , GIT irritation , Itching.
- Contra indications: Chloroquine should be used with caution in patients with hepatic disease.

Quinine :

Dose : 650 mg t.d.s. for 1 week

Side effects : Cinconism (nausea , vomiting , tinnitus) , Hemolytic anemia.

Mefloquine.

Fansidar (compination of pyrimethamine & sulphadoxine)

3 tab as a single dose.

iv. Treatment of complications : e.g. blackwater fever

- o **A**cute renal failure : dialysis.
- o **B**lood transfusion.
- o **C**ortisone

Throughout nature, infection without disease is the rule rather than the exception.

Rene Dubos

INFECTIOUS MONONUCLEOSIS

(Glandular fever)

Etiology :

1. Causative organism: **Epstein – Barr virus.**
2. Source of infection : Carriers , Patients.
3. Mode of infection : Kissing , droplets infections.

Clinical picture :

1. **Incubation period : 1 – 2 weeks.**
2. **Clinical manifestations :**
 - Asymptomatic.
 - Fatigue.
 - Sore throat , tonsillitis . **pharyngitis.**
 - **Fever** : is usually present and is low grade.
 - **Enlarged LN** , spleen & liver.
 - Transient rash on ampicillin therapy.
 - Periorbital edema.
3. **Clinical variants :**
 - Glandular type.
 - Aglandular type : especially in elderly patients.
 - Febrile type : with high fever.
 - Icteric type : with jaundice , especially in elderly patient.
 - Encephalitic type.

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Infections

4. **Complications :**

- o Liver : hepatitis.
- o Spleen : Rupture.
- o Blood : Autoimmune hemolytic anemia , thrombocytopenia.
- o CNS : Meningitis, encephalitis, transverse myelitis , Guillain-Barré syndrome. EBV infection has also been proposed as a risk factor for the development of *multiple sclerosis* but this has not been confirmed.

Investigations :

1. CBC :lymphocytosis & monocytosis .
2. Culture and BM examination.
3. Serological tests: anti EBV antibodies.
4. Specific : monospot test(antibodies in human serum $\Rightarrow$ agglutinate horse RBCS)

Differential diagnosis :

1. Specific.
2. PUO (*Pyrexia of Unknown Origin*)

Treatment :

a) Prophylaxis :

- i. Hygienic measures.
- ii. Case finding.
- iii. Isolation & Proper treatment.
- iv. Chemo & immuno – prophylaxis :

b) Therapeutic :

- i. General : Rest , light nutrient diet.
- ii. Symptomatic : antipyretic.
- iii. Specific : no specific ttt.
- iv. Treatment of complications.

FEVER OF UNKNOWN ORIGIN (FUO)

Definition :

Persisting elevation of body temperature over 38.5 for at least 2 weeks without diagnosis after proper history taking ,physical examination & routine investigations .

Causes :

Infections (30%)

Bacterial:

- TB
- IE
- Typhoid fever
- Brucellosis
- Lung abscess
- Pyelonephritis
- Septic focus (prostatitis)

Viral :

- EBV – CMV – HIV – Hepatitis

Protozoa :

- Malaria
- Amoebiasis

Types of Fever

Sustained fever: daily fluctuations less than 1 c°

Remittent fever: daily fluctuations more than 1 c°

Hectic fever: temp. falls to normal level once or more during the day.

Relapsing fever: short days of fever intercepted by short days of normal temp.

Normal body temp. is 36.5 – 37.3 c°

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Malignancy (20%)

hematologic :

- Lymphoma
- Leukemia

Non hematologic :

- Hypernephroma
- Hepatoma
- Bronchogenic carcinoma

Collagen disease (10%)

- Rheumatic fever , PAN , SLE , RA

Others (20%)

- Sarcoidosis.
- Pulmonary embolism.
- Hemolysis.
- Crohn's disease.
- Cerebral hemorrhage.
- Atropine.

Undiagnosed (20%)

Most will resolve spontaneously

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Infections

Investigations :

1. Lab :

- ESR ↑: TB , collagen, malignancy.
- CBC: leukemia , anemia.
- Blood culture.
- Urine & stool culture.
- Liver , kidney function test.
- Serology → widal test , ANA & Anti DNA.

2. Imaging :

- x-ray: chest , bone.
- U/S :Heart , Abdomen , Pelvis.

3. Endoscopy :

- upper GIT & lower GIT.

4. Biopsy :

- LN , Bone marrow , liver.

5. Skin test :

- tuberculin test.

6. Therapeutic tests :

- Mitronidazole (amoeba)
- Chloroquine (malaria)
- Aspirin (RF)

FEVER WITH RASH

- Exanthemata :
 - o Measles
 - o German measles
 - o Chickenpox
 - o Scarlet fever
- Rheumatic fever
- Infective endocarditis
- Infectious mononucleosis
- Meningitis
- Typhoid
- Leukemia
- SLE
- Septicemia
- Skin disease
- Secondary syphilis
- Drug allergy

FEVER WITH RELATIVE BRADYCARDIA

A. Specific fevers:

- Viral infection eg , influenza , viral hepatitis , mumps .
- Typhoid fever
- Mycoplasmal pneumonia

B. CNS lesions with increased ICT:

- Meningitis
- Encephalitis
- Brain abscess
- Intracranial hemorrhage eg , subarachnoid & pontine hemorrhage.

FEVER WITH SORE THROAT

1. Local throat diseases:

- Tonsillitis
- Pharyngitis
- Vincent's angina
- Pharyngeal abscess
- Pharyngeal ulcers

2. Specific fevers:

- Diphtheria
- Infectious mononucleosis
- Scarlet fever

3. Hematological diseases:

- Leukemia
- Neutropenia eg. in aplastic anemia

FEVER WITH RIGORS

- | | |
|--|------------------------|
| • Malaria. | • Liver abscess. |
| • Hemolytic crisis. | • Subphrenic abscess. |
| • Blood transfusion (hemolytic or pyogenic reaction) | • Pyelonephritis. |
| • Military TB | • Perinephric abscess. |
| • Septicemia. | • Appendicitis. |
| • IE. | • Osteomyelitis. |
| • Cholecystitis. | • Prostatitis. |
| • Cholangitis. | • Puerperal sepsis. |
| | • Salpingitis. |

TREATMENT OF ANCYLOSTOMA – ASCARIS – ENTROBIUS VERM.

1. **Flubendazole or Mebendazole:** Drug of choice (100 mg. 1x2x3)
2. **Thiabendazole:** 25 mg/kg/day for 2 days
3. **Pyrantel Pamoate:** 11 mg/ kg single dose
4. **Levamisole:** 150 mg single dose

NB in case of Entorobius verm. ttt. of all family members at the same time.

TREATMENT OF BILHARZIASIS

1. **Praziquantel:**

Drug of choice of all types.

Mechanism of action : Ca influx into the worm → marked contraction & spastic paralysis of the worm.

Dose: 40mg / kg oral single dose.

S/E: headache, abdominal pain , nausea, vomiting, pruritis, fever, elevation of liver enzymes.

2. **Oxamniquine.**
3. **Metrifonate.**
4. **Niridazole.**

TREATMENT OF GIARDIA

1. **Metronidazole:** 2gm single dose for 2 successive days.
2. **Tinidazole:** 2gm single dose.

This is only the Drug treatment take care there are other treatment items like general care, symptomatic ttt., and ttt. of complications.☺